New Trends and Solutions in Mobile Business

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Nowadays the business medium requires anytime and anywhere connectivity. In an increasingly competitive business environment, more and more organizations need fast responses and instant results. Therefore, mobility changes the way companies do business; instant messaging, voice services, real-time LAN access, network access while traveling are transforming the business environment.

In this context, WLANs are critical from the business point of view. The effectiveness with which employees make decisions drives to the success or failure of the business; thus, the business must enable employees to access the information needed to exceed corporate expectations. This article presents the key characteristics of the mobile business and analyzes a possible solution offered by a giant of the networking industry.

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Introduction
The way organizations doing business has changed over the past years. Nowadays, the companies are deploying WLANs to increase employee productivity, enhance collaboration and improve responsiveness to customers. The business efficiency of a company depends on how employees have access to business applications, services and tools from any location, anytime. Thus, mobility can help companies to use existing business processes to deliver incremental value in real time through innovative services. In fact, mobility is the most important characteristic of the mobile business, because it represents its main distinctive advantage upon which mobile services can build their value proposition.

The major benefits that mobility brings along are: freedom of movement (services can be used while on traveling), ubiquity (the possibility of using services anywhere, no matter of the user's location), localization (user's location information can be used to offer location-based relevant services), reachability (users can be reached anytime, anywhere and they can restrict it to particular persons and contexts), convenience (as mobile devices are always at hand), instant connectivity and personalization (because the mobile device is a personal one it can be used to provide personalized information).

2. Characteristics of the mobile business
All over the world we may notice the mobile revolution occurring in business; now decision making is happening at Internet speed, and Wi-Fi enabled notebook computers are proliferating and driving the implementation of enterprise wireless LANs, making the business mobile.

2.1. Mobility
The most important characteristic of mobile business is mobility; since it represents its main advantage upon mobile which mobile services can build their value proposition [1]. Mobility brings some benefits that are related to a number of attributes such as freedom of movement (services can be used by traveling, for instance), ubiquity (represents the possibility to use the services anywhere, no matter the location is), localization (user's localization information can be used to offer relevant services), reach ability (users can be reached anytime, anywhere), convenience (mobile devices are always at hand) and personalization (because a mobile device is a personal asset, it can store and deliver personalized information).

Mobility also involves some disadvantages: wireless services are inferior to their wire line counterparts in different other dimensions. In particular, mobile applications suffer from limited and more expensive bandwidth and device limitations. The limitations of the bandwidth are a consequence of radio spectrum being a fixed and rare resource and its control being restricted to license owner. Equipment limitations are due to the portabil-

ity requirement of mobile handsets that have to be small and lightweight, letting limited space to be used for screen, batteries and input/output interfaces. With all these constraints, valuable services can be built around mobility, and real-time interaction, instant messaging, text paging, voice services, network access while traveling and real-time network access in the office are transforming the business environment; the result is that organizations need short response time and immediate results for a bigger competitiveness.

2.2. Networking benefits

A network is defined as a set of entities connected together by links or communication media. Since a provision of a service typically requires several components, they are complementary to each other. As a result, the complementarily drive to a phenomenon known as the network effects. The network effects (or benefits) come from the externality, which occurs when a transaction between two actors affects a third, party that is external to the transaction. In this case the externality is considered to be positive because the third party gains value from the transaction and it is said to be a consumption externality because it affects the third party's consumption function.

In terms of a communication network there are also indirect externalities where the users benefit indirectly from the network size. If an extra customer potentially increases the number of services available to the other customers, since by increasing the demand for services, service provisioning become more profitable and more companies tend to offer those [6].

2.3. Strict control of the assets

The market of the mobile business is characterized by the existence of important assets that are under strict control of a company. This strict or even exclusive control may come from a number of reasons: the rarity of a good, the existence of a manufacturing secret, or a special patent, innovation or trademark that gives its owner the exclusivity over an asset. Also, in telecommunication spectrum is a required but finite asset. Several

domains, like military, TV and radio broadcasting, navigation, transportation require communication spectrum. Moreover, spectrum access is restricted (except some amateur frequencies bands) by licenses given to a few license owners, so that the available spectrum is under strict control of a few network operators.

Network operators have also total control over their customers by giving them SIM cards in order to use their mobile network. In the communication field the infrastructure deployment is considered to be a natural monopoly because of the hard financial investments required to build a network. Since the presence of a monopolistic firm is not an ideal solution in the field (a single company can exploit its dominant position to raise prices, for example, above competitive levels), today there is „implemented" an oligopoly structure to assure the presence and competition for a few network operators.

2.4. Challenges

All the characteristics of the mobile business can drive us to the conclusion that the provisioning of a complete set of mobile solutions (technological, hardware equipment, application software, management software, etc.) would require the collaboration of a large number of market players, especially including network operators, service providers and device manufacturers. The most important characteristic of mobile business, the mobility, brings a great complexity to application and services development; require broader competencies that in short term are only accessible through partnership or acquisition. The network benefits and effects require that all the parts involved (equipments, networks, applications) must be interoperable, and all the partners must use common standards (in fact, the beginning of the introduction of the networking standards in the 1980's led to the huge success networking has today).

Concluding, partnership management is thus likely to become a core activity of a large number of mobile business enterprises, because it is hard that a single player to succeed in providing an end-to-end solution between the content owner and the end-user without

collaboration. However, there are some particular exceptions; an example is the one of the i-mode service of NTT DoCoMo in Japan (for more information you may visit http://www.nttdocomo.com/) and a partial one is the solution addressed to the need for enterprise-class wireless connectivity with the Cisco Unified Wireless Network.

In the desire to offer a comprehensive solution for the companies decided to turn mobile, Cisco Systems has built a solution to determine the best approach in building a wireless infrastructure. In the following we will present and analyze the key features of this mobile business solution from Cisco Systems.

3. Cisco System's Unified Wireless Network

The wireless networking is today's the core of the business mobility strategy. Wireless networking has revolutionized the workplace, letting companies to introduce compelling new applications and extend mobility services to employees in a secure, scalable and reliable manner. An organization's wireless network must be flexible enough to adapt to new business requirements, while integrating into the existing wired network to simplify business processes and deliver a very good TCO (Total Cost of Ownership).

3.1. Introduction

As a leader in enterprise networking, Cisco can use its decades of experience in building enterprise class data networks to help ensure that the wireless network performs to the same standards as the wired network. The aim of any infrastructure unification should be to support the business in value creation, either by serving as a platform for new applications or by improving operating efficiencies. To provide the full benefits of unification, the initiative must extend across multiple layers.

Unification of components and products is necessary, but in no way a complete solution. True unification extends beyond the technology layer to include network services, business applications, and business processes such as management and support, administration, and even procurement. The business

will see the rewards of unification in decreased capital and operational expenditures, single security and management frameworks, and improved application support, leading to greater employee productivity [2].

3.2. Definition

The Cisco Unified Wireless Network represents "a solution that unifies the wired and wireless networks to provide enterprises with a secure, scalable, and manageable platform for delivering mobility services. With this innovative solution, unification occurs at all levels, including hardware, software and services. The Cisco wireless solution takes a comprehensive approach that enables mobility from the application layer to the client device."[3]

3.3. Components

As described in the documents from Cisco Systems, the Cisco Unified Wireless Network includes five interconnected elements: mobility services, world-class network management, network unification, mobility platforms, and client devices. For more information about the components of the Cisco Unified Wireless Network,

one may see the brochure "Cisco Unified Wireless Network Overview" at http://www.cisco.com/en/US/products/ps6366/prod_brochure09186a0080184925.html.

Let's have a look at some interesting information about client devices. The worldwide surveys say that more than 95 percent of today's notebooks are Wi-Fi enabled, and a wide range of specialized Wi-Fi client devices are now available for industry-specific applications. Also, to address enterprise WLAN needs, client devices must interoperate securely in the wireless networks and must provide the needed features. Cisco Compatible and Cisco Aironet Client Devices – Cisco Compatible devices are recommended for the Cisco Unified Wireless Network. Having more than 90 percent of shipping client devices certified as Cisco Compatible, almost any client device that is selected will support Cisco's advanced features. This applies not for Cisco manufactured devices; by providing third party tested compatibility, the Cisco Compatible Exten-

sions program helps to ensure the widespread availability of client devices from a variety of suppliers that are interoperable with a Cisco WLAN infrastructure. Over 300 wireless devices are Cisco Compatible certified today (with more being added all the time). With the Cisco Compatible Extensions program, Cisco is able to deliver next-generation WLAN features-today [3].

The Cisco Unified Wireless Network also supports Wi-Fi Certified or IEEE 802.11 clients, but Cisco Compatible or Cisco Aironet client devices are recommended for their innovative, advanced Cisco-verified features.

Regarding security, Cisco Secure Services Client - The Cisco Secure Services Client is also recommended. The Cisco Secure Services Client is a software supplicant that enables organizations to deploy a single authentication framework on multiple device types to access both wired and wireless networks.

This capability helps organizations simplify management, improve security and lower their total cost of ownership (TCO). The software client manages the user and device identity and the network access protocols required for secure access. It delivers intelligent services to optimize the user experience when connecting to a Cisco unified wired and wireless network.

4. Conclusions

The limited space for this article do not allow to present more features of the Cisco Unified Wireless Network, but we may resume that the Cisco Unified Wireless Network supports solid features and benefits through robust product capabilities. This solution provides management centralization with control in the infrastructure. The key characteristics are related to: security (controlled access to the WLAN via numerous authentication and encryption policies, including 802.11i, Wi-Fi Protected Access (WPA), WPA2, and mobile VPNs), management (Cisco simplifies WLAN management by providing clear visibility and control of the RF environment,

performance (QoS for voice and delay-sensitive applications, self-healing WLANs, etc.), mobility (end users need uninterrupted network access when roaming across access points). Also, Cisco's WLAN solution delivers support for the following: scalability, integration, services/applications (support for voice services through a software application or a handset device, high-resolution location tracking for users and assets, guest access to enable customers, consultants, contractors, suppliers, and vendors).

Nowadays, business is mobile. There is no full solution coming from only one vendor for implementing a mobile enterprise, but Cisco's Unified Wireless Network represents a viable solution for deployment, management and RF challenges associated with building business-critical WLANs, a solution worthy to be considered when switching to a mobile business.

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